# *Haemophilus influenzae* type b Invasive Disease

## CLINICAL CASE DEFINITION

Invasive disease caused by *Haemophilus influenzae* may produce any of several clinical syndromes, including meningitis, bacteremia, epiglottitis, or pneumonia.

## CASE CLASSIFICATION

- **Probable**: A clinically compatible case with detection of *H. influenzae* type b antigen in cerebrospinal fluid (CSF).

- **Confirmed**: A clinically compatible case that is laboratory-confirmed.

**Comment**: Positive antigen test results from urine or serum samples are unreliable for diagnosis of *H. influenzae* disease.

**Note**: False positive results may occur from asymptomatic nasopharyngeal carriage of Hib, recent Hib vaccination, or contamination of urine specimens by cross-reacting fecal organisms. Cases identified exclusively by these methods should not be reported.

## TRANSMISSION

The mode of transmission is person-to-person by inhalation of respiratory droplets or by direct contact with respiratory secretions.

## INCUBATION PERIOD

Unknown, probably short, 2-4 days. See *Hib* Timeline, below.

## PERIOD OF COMMUNICABILITY

As long as organisms are present, which may be for a prolonged period even without nasal discharge; non-communicable within 24-48 hours of starting appropriate antimicrobial therapy.

## REPORTING/INVESTIGATION

Health care providers should immediately report cases/suspect cases of invasive *H. influenzae* disease to local health department serving the residence of the case.

Local health department responsibilities:

- Contact case/guardian and health care provider.

- Determine if case meets clinical case definition.

- If definition met (probable or confirmed cases), investigate using control guidelines below.

- Assist with coordination of specimen collection and coordination if public health lab resources (MDCH, CDC, etc) are used.

- Report/ensure reporting of case to the Michigan Disease Surveillance System (MDSS). CDC National Bacterial Meningitis and Bacteremia Case Report form may be helpful in field investigation to collect and capture data (WARNING: file size is large and will take a while to download).

- Obtain immunization history information from provider record or MI Care Improvement Registry (MCIR - state immunization registry).

- Update the MDSS record in a timely manner with new or additional info as it becomes available. Finalize MDSS record when case investigation is complete.

- In the event of death, obtain and send copies of hospital discharge summary, death certificate, and autopsy report to MDCH Immunization Division.

## LABORATORY CONFIRMATION

- Isolation of *H. influenzae* from a normally sterile site (e.g., blood or cerebrospinal fluid [CSF] or, less commonly, joint, pleural, or pericardial fluid).

- All isolates of *H. influenzae* from sterile sites in persons under 15 years of age should be serotyped. If the laboratory that cultured the *H. influenzae* organism does not perform serotyping, arrangements should be made to send the isolate to MDCH Laboratory for serotyping.

See LABORATORY SPECIMENS: PROCEDURES AND CONSIDERATIONS, below, for additional information.

## IMMUNITY/SUSCEPTIBILITY

- Susceptibility is universal; protection results from prior infection or immunization.

- Invasive disease due to *H. influenzae* type b is uncommon in persons over 5 years of age; prior to routine childhood immunization, approximately one in 200 children developed invasive Hib disease by age 5.

- Persons over age 5 who are at increased risk include:

    - immunocompromised persons such as those receiving immunosuppressive therapy or infected with HIV;
    - persons who have functional or anatomic asplenia (e.g., sickle cell disease, post-splenectomy).

## CONTROL MEASURES

- Reports of *H. influenzae* invasive disease in children <5 should be investigated immediately.

- Identify all exposed contacts < 5 years of age. Household and day care contacts should be considered close contacts.

- Provide information about *H. influenzae* invasive disease to persons at risk and/or the general public. An excellent Question-&-Answer *Hib* information sheet information sheet in **.PDF** format is available from the Immunization Action Coalition.

**Chemoprophylaxis recommended as follows -**

- For all household contact in the following circumstances:
    - Household with at least 1 contact younger than 4 years of age who is unimmunized or incompletely immunized.
    - Household with a child younger than 12 months of age who has not received the primary series.

- Household with a contact who is an immunocompromised child, regardless of that child's Hib immunization status.

- For nursery school and child care center contacts, regardless of age, when 2 or more cases of Hib invasive disease have occurred within 60 days.
- For the index case, if younger than 2 years of age or member of a household with a susceptible contact and treated with a regimen other than cefotaxime or ceftriaxone, chemoprophylaxis usually is provided just before discharge from hospital.

**Chemoprophylaxis Not Recommended**

- When the serotype of *H. influenzae* is known and is not type b.
- For occupants of households with no children younger than 4 years of age other than the index patient.
- For occupants of households when all household contacts 12 to 48 months of age have completed their Hib immunization series and when household contacts younger than 12 months of age have completed their primary series of Hib immunizations.
- For nursery school and child care contacts of one index case, especially those older than 2 years of age.
- For pregnant women.
- For hospital personnel exposed to a child with invasive Hib disease.

**Prophylactic Therapy / Dosage:**
Rifampin is recommended for chemo-prophylaxis; the recommended dosage is 20 mg/kg (maximal daily dose 600 mg) orally as a single daily dose for four days. The dose for infants <1 month of age is not established; some experts recommend lowering the dose to 10 mg/kg. The adult dose is 600 mg.

When prophylaxis is indicated under these guidelines, it should be given both to children who have and who do not have a history of previous Hib immunization. (Source: Red Book)

In addition to chemoprophylaxis, unvaccinated or incompletely vaccinated children should receive a dose of vaccine and be scheduled for the completion of the recommended age-specific immunization schedule. (Source: Red Book)

Exclusion of exposed susceptible contacts:
In out-of-home child care, only children who are age-appropriately immunized should be permitted to enter the child care group during the time prophylaxis is given and for two months after onset of the cases. (Source: Red Book)

## LABORATORY PROCEDURES AND CONSIDERATIONS

- Confirmation of a case of *H. influenzae* type b invasive disease requires culture and isolation of the organism from a normally sterile body site, such as

  - cerebrospinal fluid (CSF)
  - blood
  - joint fluid
  - pleural effusion
  - pericardial effusion
  - peritoneal fluid
  - subcutaneous tissue fluid
  - placenta
  - amniotic fluid

- Most hospitals and commercial microbiologic laboratories have the capability to isolate *H. influenzae* from cultured specimens, but many do not perform organism serotyping.

- Serotyping of *H. influenzae* isolates is essential for complete and effective surveillance; arrangements should be made to serotype all isolates, especially from patients under 15 years of age.

- The Michigan Department of Community Health Laboratory performs serotyping. To make arrangements:

- Call the MDCH VPD Surveillance Coordinator at 517-335-8159 or MDCH Microbiology Laboratory at 517-335-8067.

NOTE: The isolate must be growing well on a chocolate agar slant before it is transported.

Complete MDCH Microbiology/Virology Test Requisition, form DCH-0583 (formerly FB 200), indicating “H. flu serotyping” in the “Other Test” area.

Send the cultured isolate to:

Michigan Department of Community Health
Bureau of Laboratories DASH Unit
3350 N. Martin Luther King Blvd.
Building 44, Room 155
Lansing, MI 48909

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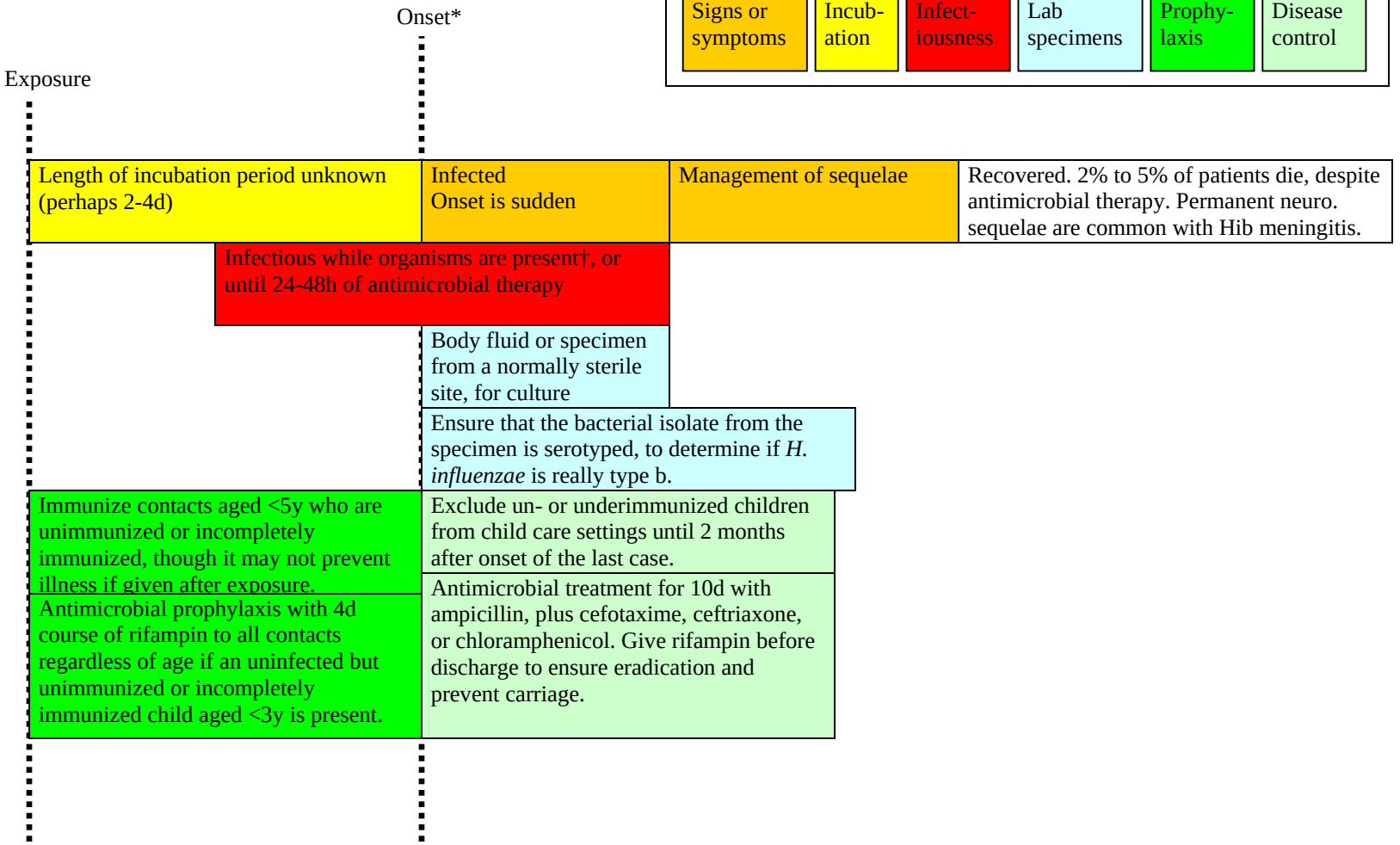
## Hib* timeline diagram

Key: Numbers in parentheses, e.g., "(12-25d)", are outer ranges.

Signs or symptoms | Incub-ation | Infect-iousness | Lab specimens | Prophy-laxis | Disease control




* Invasive disease caused by *Haemophilus influenzae* type b only, which is rare in children older than 5y. Invasive disease includes meningitis, epiglottitis, pneumonia, septic arthritis, and cellulitis (less commonly osteomyelitis and pericarditis).
† Asymptomatic carriage occurred in 0.5% to 3% of normal children and infants in the pre-vaccine era.

Sources: Control of Communicable Diseases Manual, Red Book, Pink Book, CDC VPD surveillance manual